

Hudson County Community College

Introduction to Engineering Science & Calculations, CNM 120

Course: CNM – 120

Course Title: Introduction to Engineering Science & Calculations

Credit: 4

Instructor:

Day(s) and Time (s):

Location

Office Hours:

Office Location:

Email:

Course Description: This is a preparatory class for the students who intend to pursue a career in Construction Management or in the field of Civil Engineering. This course develops an understanding of the science and mathematics involved in engineering. Students learn to perform mathematical calculations used in construction and project management. Students analyze physical laws and how to apply that analysis in engineering fields.

Homework: Homework assignments are given every week.

Course Prerequisite: Take MAT-100 and Co – requisites CHP 100, CSC 100

Student Learning

Outcome:

Upon completion of this course you should be able to:

- Demonstrate an understanding of basic scientific concepts applicable to engineering problems
- Analyze and interpret data applicable to an engineering problem
- Calculate numerical/engineering problems with precision and accuracy
- Apply critical thinking/quantitative/quantitative reasoning to engineering project
- Identify health, safety and environmental regulation requirements at an engineering site

Instructor will provide access to open source material.

Lectures will be posted on the Canvas

Text Book: *College Physics by Serway/Faughan 10th Edition: ISBN# 13 – 9781285737027*
Foundation of College Chemistry: 14th Edition; ISBN# 13 - 2901118298236

Book Purchase: These are the reference books only and will not be recommended to purchase; class notes and assignments will prepare the students to fulfill the intent of the course. Any student who has true financial need is eligible to apply for a book scholarship through the Office of the Dean of Students located at 70 Sip Avenue.

Attendance: The college policy is generally that a student may fail a course due to lack of attendance if s/he missed more than 8 hours of instructional time for a 4-credit course.

Grading Policy:	Final Exam	40 points
	Midterm	30 points
	HomeWorks	10 points
	Attendance	10 points
	Class Participation	10 points

You are required to attend all classes even if you get A in first two tests.

Breakdown of Grading:

100 - 94 = A	69 - 64 = C+
93 - 90 = A-	63 - 54 = C
89 - 84 = B+	53 - 50 = D
83 - 75 = B	Below 50 = F
74 - 70 = B-	

Cell Phone Use Policy:

Cell phones should be on manner mode. In case of emergency, notify me and then leave. Leaving classroom for non-emergency calls will result a zero grade in one test. **NO texting during lectures or exams!** Cell phones may **NOT** be used during exams

Mandatory Use of

HCCC Email Address: Members of the HCCC community are required to check their official HCCC email address in order to stay current with College and course communications. All college business communication between faculty, students, and staff must be sent via an official HCCC email address. If an employer or student elects to forward

or link his/her HCCC email to a separate and private account, that individual remains responsible for all material transmitted to that account. Employees of HCCC shall not be responsible for any material that remains undelivered, due to defects in the private non-HCCC accounts. Failure in the operations of private email accounts shall not be cause for excuse from communications between the students and the employee. Students that encounter difficulty with HCCC email should view the FAQ's section on the Portal.

Incomplete:

An INCOMPLETE grade for the course is given under specific conditions when a student, because of serious and unexpected reasons, cannot complete the requirements of the course. For example, if a student did not attend the final because of illness his or her excuse must be verified by a physician. Other absences from other assigned activities must be made up at another appointed time. To arrange for an incomplete grade, the student must see the instructor before final exam, so proper documentations could establish and submitted to Division and The office of Academic Affairs.

Disability Support Services:

Students with disabilities who believe that they might need accommodations in this class are encouraged to contact Disability Support Services at (201) 360-4157, as soon as possible to better ensure that such accommodations are implemented in a timely fashion. All disabilities must be documented by a qualified professional such as a Physician, Licensed Learning Disabilities Teacher Consultant (LDTC), Psychiatrist, Psychologist, Psychiatric Nurse, Licensed Social Worker or Licensed Professional Counselor, who is qualified to assess the disability that the student claims to have and make recommendations on accommodations for the student. All information provided to the Disability Support Services Program will be confidential between the program, professors involved with the student, and individual student.

Academic Integrity Standards:

Academic integrity is central to pursuit of education. For students at HCCC, this means maintaining the highest ethical standards in completing their academic work. In doing so, students earn college credits by their honest efforts. When they are awarded a certificate or degree, they have attained a goal representing genuine achievement and can reflect with pride on their accomplishment. This is what gives college education its essential value.

Violations of the principals of academic integrity include:

- Cheating on exams
- Reporting false research data or experimental results
- Allowing other students to copy one's work to submit to instructors

- Communicating the contents of an exam to other students who will be taking the same test
- Submitting the same project in more than one course, without discussing this first with instructor
- Submitting *plagiarized* work. *Plagiarism* is the use of another writer's words or ideas without properly crediting that person. This unacknowledged use may be from published books or articles, the Internet, or another student's work.

Violation of Academic Integrity:

When students act dishonestly in meeting their course requirements, they lower the value of education for all students. Student who violate the college's policy on academic integrity are subject to failing grades on exams or projects, or for the entire course. In some cases, serious or repeated instances of academic integrity violations may warrant further disciplinary action.

Detailed information on the College's Academic Integrity policy may found in the *HCCC Student Handbook*. The handbook also contains useful information for students on completing research projects and avoiding plagiarism.

Classroom Recording Policy at HCCC

Student Classroom Recording Policy

- Hudson County Community College prohibits the audio-visual recording, transmission, and distribution of classroom sessions. Classes may only be recorded with the advance written permission of the instructor. The Hudson County Community College classroom recording policy must be listed in all syllabi.
- All classroom recordings can only be used for academic purposes by students enrolled in that class. Recordings may not be shared, reproduced, or uploaded to public websites or other mediums, and these recordings may contain copyrighted material and are prohibited from any form of commercial use.
- All students and guests must be informed that the class may be recorded. Due to issues related to privacy and the possible inhibition of student participation, instructors should be mindful of the effects of permitting classroom recording.
- Instructors should retain electronic or paper copies of their written consent to grant classroom recordings.
- Students must destroy their recordings at the end of the semester.
- Students who are granted permission to record their class by the office of Disability Support Services should inform the instructor beforehand and are subject to the policies outlined in this document.

- Violation of this policy is subject to disciplinary action listed under the code of conduct as included in the Student Handbook.

Instructor Classroom Recording Policy

- Instructors may record their classes if students are informed in writing in advance that recording will take place. Instructors may distribute their own lectures, but this must be limited to the lecture portion of the class. Recordings of student presentations or activities may be used in the class if the students are notified in advance of the recording. Recordings of student presentations or activities may not be distributed in any way without the advance written consent of the students.

Successful people access support from others when needed. Hudson County Community College has many supportive services available to help you meet your goals. You are encouraged to contact your instructors or other professionals on campus. Below are resources available to you.

IN AN EMERGENCY, PLEASE CONTACT SECURITY or 911.

	Journal Square Campus	North Hudson Campus
<u>Counseling Services</u> counseling@hccc.edu	201-360-4150 A Building, Floor 2 https://myhudson.hccc.edu/advisement	201-360-4150 Enrollment Center, Floor 1 https://myhudson.hccc.edu/advisement
The National Suicide Prevention Lifeline: 1-800-273-8255 Crisis Text Line: Text HELLO to 741-741		
<u>Advising Services</u> advising@live.hccc.edu	201-360-4150 A Building, Floor 2 https://myhudson.hccc.edu/advisement	201-360-4150 Enrollment Center, Floor 1 https://myhudson.hccc.edu/advisement
<u>Career Development</u> career@hccc.edu	201-360-4181 A Building, Floor 3 https://myhudson.hccc.edu/career-development	201-360-4181 Floor 2, Room 204 https://myhudson.hccc.edu/career-development
<u>Disability Support Services</u> dss@hccc.edu	201-360-4157/4163 A Building, Floor 2 https://myhudson.hccc.edu/dss	201-360-4157/4163 Enrollment Services, Floor 1 https://myhudson.hccc.edu/dss
<u>Library</u> Journal Square librarian@hccc.edu North Hudson librarynhc@hccc.edu	201-360-4360 L Building, Floor 1 http://www.hccclibrary.net/	201-360-4605 Floor 3 http://www.hccclibrary.net/
<u>Tutoring Center</u> tc@hccc.edu	201-360-4187 Lower Level of Library Building https://myhudson.hccc.edu/tutoring	201-360-4623 Floor 5, Room 511 https://myhudson.hccc.edu/tutoring
<u>Writing Center</u> wc@hccc.edu	201-360-4370 J Building, Room 204 https://myhudson.hccc.edu/tutoring	201-360-4779 Floor 7, Room 703A https://myhudson.hccc.edu/tutoring/

Engineering Science & Calculations (CNM 120)

Tentative Course Schedule

1. Introduction to the course, grading policy, course
Requirements, different formulae with engineering applications, Area, and volume calculations for different engineering figures, tabular, textual, line graph, bar graph and pie graph as a technique of scientific data and its presentation, histogram, and frequency polygon. Numerical problems based on area and volume calculations. HW#1
2. Concept of density and its engineering application, specific gravity, pressure, and its engineering application (atmospheric, gas, absolute, gauge and osmotic and hydraulic pressures), laws of mechanics, friction, concept of inertia. Numerical problems based on the density, pressure, friction, and laws of mechanics. HW#2
3. Bridge Engineering & application of science; External and internal forces, Newton of gravitation, Hook's law (force in a spring) construction material and their properties, tensile, compressive and shear forces, Torque, moment, concept of axis of rotation and distance from moment arm, conditions of equilibrium. Numerical problem based on the topics discussed in the class. HW#3.
4. Resolution of forces, Impact of the forces in causing moment and torque, force concept of Couple, structure supports and their types, reactions and their types, centroid and center of gravity, body's weight and its point of application, Free Body Diagram (FBD). Numericals based on the discussed topics. HW#4
5. Elementary Statics & Dynamics, Fluid Properties; Basic physical parameters (length, time, mass, weight), particle, rigid and flexible bodies, static and dynamic loads on the structure (point load, concentrated load, uniformly distributed load and variable loads), Resultant of a forces, methods of resultant determination, simple machines (lever, pulley, inclined planes), mechanical advantage of simple machines. Fluid definition and their properties, viscosity, compressibility, surface tension, vapor pressure, Pascal's Law Heat Impact on material (Structures) HW#5
6. Bridge Electrical Systems, Movable Bridges & their basic theory of application; Types of Bridges, fixed and movable, types of movable bridges (bascule, vertical and swing), principal of their

application, main bridge components, types of failures and causes of failures, required maintenance and repairs, weather impact on bridge structures (expansion and contraction), specific heat, modes of heat transfer. Numerical based on the class lecture. HW#6

7. Expansion of material, linear, superficial, and volumetric expansions, temperature effect on the material, bending, shrinking, and cracking due to temperature, electrical application in construction of bridges, charge, current, voltage. Basic laws of electrical (ohms law, coulomb's law), potential difference and voltage, resistors and insulators, power, energy, efficiency, Types of circuits, series and parallel and their properties. Numerical problems based on the discussed topics. HW#7.

8. Chemistry I; mole, mass, reactants, quantitative relationship of reactants and products, percent composition, types of chemical reaction, exothermic and endothermic reaction, chemical ingredients of cement and their properties, calculating heat of hydration produced in a chemical reaction of concrete, Corrosions, methods of prevention of corrosions, organic coating to prevent corrosions. Numerical Problems based on the class lecture. HW#8

9. **Midterm**

10. -----Spring Break (No Class) -----

11. Discussion of Midterm, Traffic stream parameters and their measurement, Speed, volume, density, headway, peak hour factor, peak hour volume, capacity of highway, Capacity and Level of Service (LOS) concepts, computation of capacity and level of service, road user characteristics, intersections and roundabouts, railroad crossings, interchanges, road segments, work zones, safety approaches, quantifying safety approaches, low cost safety improvements, intersection safety improvements, cost and benefits, Problems based on class topics. HW#9

12. Problem solving in class based on traffic engineering topics

13. Environmental Issues; Air (global warming, carbon credits), water(supply, wastewater, potable, wetlands), sustainability(energy efficiency, conservation, green building, recycling, water re-use, waste minimization), land (brownfields, landfills, remediation), waste (handling, transportation) Ecosystem/ecology (water sheds and endangered species), current industry trends (safety, risk, certification and accreditation)
14. Numerical Problems on the Environmental Issues, HW#10
15. Course Review
16. **Final Test**